

Application No. 09/265,601
Attorney Ref. No. 3364P010

PROPOSED CLAIM AMENDMENTS

1. (Four Times Amended) A negative active material for a lithium secondary battery, comprising a heat-treated graphite carbon material having an intensity ratio $I(110)/I(002)$ of an X-ray diffraction peak intensity $I(002)$ at a (002) plane to an X-ray diffraction peak intensity $I(110)$ at a (110) plane of less than 0.2, the negative active material prepared by

dissolving a coal tar pitch or a petroleum pitch in an organic solvent to remove organic-insoluble components therefrom and to obtain organic-soluble components;

heat-treating the organic-soluble components at a temperature in the range of 400 to 450 °C for 4 hours or more under an inert atmosphere to thereby produce at least 50 weight percent of mesophase particles based on the pitch;

coking the pitch including mesophase particles;

carbonizing the coked pitch;

pulverizing the carbonized pitch; and

graphitizing the pulverized pitch at a temperature higher than 2500°C.

*NM, must state
2500-3000°C
(see page 6)*

2. (Amended) The negative active material of claim 1 wherein the graphite carbon material has an intensity ratio $I(110)/I(002)$ of less than 0.04.

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3. (Four Times Amended) A lithium secondary battery comprising:
- a negative electrode comprising a negative active material;
 - a positive electrode comprising a lithium containing material that can reversibly intercalate and de-intercalate lithium ion; and
 - a non-aqueous electrolyte;
 - the negative active material comprising a heat-treated graphite carbon material having an intensity ratio $I(110)/I(002)$ of an X-ray diffraction peak intensity $I(002)$ at a (002) plane to an X-ray diffraction peak intensity $I(110)$ at a (110) plane of less than 0.2 and the negative active material prepared by
 - dissolving a coal tar pitch or a petroleum pitch in an organic solvent to remove organic-insoluble components therefrom and to obtain organic-soluble components;
 - heat-treating the organic-soluble components at a temperature in the range of 400 to 450 °C for 4 hours or more under an inert atmosphere to thereby produce at least 50 weight percent of mesophase particles based on the pitch;
 - coking the pitch including mesophase particles;
 - carbonizing the coked pitch;
 - pulverizing the carbonized pitch; and
 - graphitizing the pulverized pitch at a temperature higher than 2500°C.

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4. (Amended) The lithium secondary battery of claim 3 wherein the graphite carbon material has an intensity ratio $I(110)/I(002)$ of less than 0.04.

5. (Twice Amended) A method of preparing a negative active material for a lithium secondary battery, comprising the steps of:

dissolving a coal tar pitch or a petroleum pitch in an organic solvent to remove organic-insoluble components therefrom and to obtain organic-soluble components;

only after dissolving the pitch in the organic solvent, heat-treating the organic-soluble components at a temperature in the range of 400 to 450 °C for 4 hours or more under an inert atmosphere to thereby produce at least 50 weight percent of mesophase particles based on the pitch;

coking the pitch including mesophase particles;

carbonizing the coked pitch;

pulverizing the carbonized pitch; and

graphitizing the pulverized pitch at a temperature higher than 2500°C.

6. The method of claim 5 wherein the inert atmosphere is a gaseous nitrogen or argon atmosphere.

*only "individual components" confusing (page 8, C. 1)

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7. The method of claim 5 wherein the mesophase particles are produced by 50 to 98 weight percent based on the pitch.

8. The method of claim 5 wherein the coking step is performed at a rising temperature up to 600 °C under an inert atmosphere.

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